A New Koenenia from Texas.

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With Plate 18.

During the later part of July I received from Bonham, Texas, a small package of soil containing Koenenia, which was sent by Miss Florence Rhine. The distance from Bonham, which is in the northern part of the State, near Red River, to Austin was so great, and the heat at that time was so intense, that the soil, which was in a paper box, became perfectly dry before it reached me. However, on placing the dry earth in a large dish of water, several specimens of Koenenia, in a wrinkled and distorted condition, were floated out and taken up with a brush. The wrinkles were smoothed out, by the use of KOH, to an extent that allowed of a partially satisfactory examination of the exoskeleton. The first glance at the ventral surface of an adult female revealed the fact that an entirely new species of Koenenia had been taken.

A hasty review of the eleven specimens obtained from the dry soil showed eight to be adult females and three immature forms. Hoping to obtain perfect specimens, I immediately wrote Miss Rhine for more material, asking that it be sent in 70 per cent. alcohol. At the same time I wrote for informa-

tion on the conditions under which the little Arachnids were found, for I thought I knew the soil of Bonham to be made up of a black-waxy alluvial, entirely free from stones. This condition would necessitate their living entirely in the soil, independent of stones—a condition which I suspected to obtain in the case of K. wheeleri, though the prevalence of several stones in the soil where the latter were found made it more doubtful.

In immediate reply to both of my requests, on August 3rd I received fifty-five specimens of the new Koenenia, and the following information in regard to their environment:—"I was looking under a cedar hedge for a suitable soil for ferns, shortly after a rain, when I discovered the Koenenia which I sent you. In that place the soil was moist to the depth of several inches, and there the animals were found in greater numbers than I had ever seen them in Austin. I could hardly dig up a spoonful of the soil that did not contain as many as four specimens. The top of the earth was of a dark reddish-brown colour, due to the deposits for years of decayed cedar branches; below this the soil was very dark, and here the Koenenia were readily observed moving about incessantly. There were no stones anywhere in the neighbourhood, the conditions being unlike those found in Austin. . . . . On receiving your letter asking for more material, I was sorry to find the earth quite dry, and no Koenenia in sight. In the evening, however, I watered the hedge thoroughly, and early the next morning I procured as many as I supposed you would want."

On examining the fifty-five specimens sent, I found that they consisted principally of adult females, though a few represented two developmental stages. Hoping to get individuals of both sexes, I again begged for more material, and on August 29th received fifty-six specimens, while in September sixty more were added, making in all one hundred and eighty-two specimens which I had received. Careful examination of all these revealed the same condition that was found in the case of the European K. mirabilis, of which

not a single male had been taken up to the present time. This seemed all the more remarkable, since in the other Texan species (K. wheeleri) the males at times predominate.

Koenenia florenciæ, n. sp.

In size K. florenciæ measures from 2 to 2·3 mm. In its proportions it is not unlike K. wheeleri.

Cephalothorax.—The labrum presents a laterally compressed condition, and viewed from the ventral or dorsal surface, appears to terminate in a peak. Five pairs of labral hairs are present. These hairs are as prominent as the corresponding ones in K. mirabilis, and twice as prominent as those of K. wheeleri, where they might be easily overlooked. The hypostome presents the usual cross-furrowed appearance, resulting from the arrangement of the delicate hairs of that region. The frontal sense-organ is of normal appearance, projecting forward from under the blunt-pointed carapace. The lateral sense-organs consist of three pairs of spindle-shaped hairs with the proximal ends blunted at their point of attachment. These sensory setæ are six times as long as they are broad at their broadest axis, and are dotted over with delicate hairs. They lie close to the head, and point forward and inward, arising in such a manner that when seen from above they can hardly be counted, so nearly do they lie in the same dorso-ventral plane. When seen from the side they stand out with great distinctness. The number and arrangement of the dorsal hairs of the cephalothorax are not characteristic of the species, inasmuch as the same arrangement is met with in K. wheeleri. There are five cross-rows of hairs; the first consisting of one pair, the second, third, and fifth, each of two pairs, and the fourth of three pairs of setæ. The number and arrangement of cephalothoracic sternal hairs are characteristic of the species. In every specimen examined for this purpose except one, which had six, five prominent setæ are present. These arise in a slightly curved line, which extends over about a third of the

breadth of the animal across the mid-ventral line. Another characteristic of K. florenciæ, which appears even in the delicate exoskeleton of the youngest stage, is a tongue-shaped thickening of the sternum between the fifth pair of appendages.

Cheliceræ.—On the ventral surface of the proximal joint of the cheliceræ three setæ arise in a line parallel to the sides of the labrum. These setæ present distinguishing features characteristic of the species. In K. florenciæ the first one of these hairs is very large,—in fact, it is the largest hair to be found on the entire body of the animal; while the other two setæ are very small in proportion. The corresponding setæ in K. wheeleri which are similarly arranged are all of the same size, blunt, and delicately plumulose near the ends. In the case of K. mirabilis the first of these hairs is large, but not nearly so large as the corresponding ones in K. florenciæ. The size and relative proportions of these setæ can best be ascertained from an examination of figs. 9, 10, and 11 of the plate. The two distal joints have each eight teeth with their denticles. The teeth, in recently killed specimens, show a delicately plumulose structure, a condition which was also found in K. wheeleri. On the fixed blade the row of teeth ends with a sharp angle, while the moveable blade, which ended with a number of serrations in K. wheeleri, terminates with the last tooth. A peculiar arrangement in the fixed blade of K. florenciæ, which is so prominent as to make it worth mentioning, can best be made out from fig. 12 of the plate. This condition, though not so prominent, is also observed in the movable joint. It is a bulb-like attachment appearing in the cavity of the blade, on a line with the penultimate tooth. Extending from that side of the bulb nearest the teeth is a chitinous rod which becomes fused with the wall of the blade after extending down the cavity for its whole length.

Other Appendages.—The pedipalps conform throughout to the corresponding appendages in the other known species. The last leg, like that appendage in K. wheeleri, has, on the

upper surface of the metatarsus, a large, hollow, sensory seta, which arises at about the middle of the joint. As would be expected from our knowledge of the other members of this group, K. florenciæ has the usual number of seven delicate sensory setæ. The first one arises from the outer surface of the patella, one third of the distance from its distal end. The next two arise from the upper and distal limit of the first metatarsus, while the second metatarsal joint bears one on the proximal limit of its upper surface, and one near the middle on the outer surface. The fourth metatarsus and second tarsus each gives off one of these hairs from its upper surface. So far as I am aware no statement has been made in regard to the proportionate length of these delicate organs. In K. florenciæ the uppermost hair of the first metatarsus and the one arising from the second tarsus are only of about half the length of the other metatarsal hairs, while the corresponding hair of the patella is lacking somewhat in length. Bifurcating hairs are present on the first and second metatarsus, and second and third tarsus. Characteristic of the species is the size and the situation of the large, hollow, flat seta of the third metatarsal joint. This seta is situated at about one half of the distance from the proximal end of the joint. It is shorter and narrower than the corresponding organ in K. wheeleri, which arises from the distal end of the joint. In K. florenciæ, on the opposite side of the joint from where the seta arises, is another hollow though round and pointed seta, which is much longer and almost as broad.

The Abdomen.—In K. florenciæ is found the usual belt of setæ on all eleven of the segments except the first. It is in the arrangement of these setæ that K. florenciæ differs from all of the other described species. Along the dorsal and lateral surfaces of the abdomen, a strip, made conspicuous by the absence of setæ, extends to the seventh segment. The remaining are regularly adorned with setæ at approximately equal distances apart. The most striking differences between the two Texan Koenenia are to be found on the ventral surface of the abdomen. No lung-sacs are present in K.

florenciæ. In sections, however, the region corresponding to the lung-sac areas reacts to stains in exactly the same way as do the cells around the inverted lung-sacs of K. wheeleri. Specimens stained in borax carmine show three pairs of deeply stained patches on the ventral surfaces of segments 4, 5, and 6. The arrangement of the setæ on the ventral surface is entirely different from any other described species. On segments 4, 5, and 6, just over the peculiarly stained areas above mentioned, there is a crowding of the setæ of the belts, so that two groups of four setæ each are observed on each side of the mid-ventral line. From their situation these setæ correspond to the four pairs of protective setæ of the lung-sacs of K. wheeleri. Like K. siamensis, K. florenciæ presents an identical appearance of the ventral surface of segments 4, 5, and 6. Segment 7 is likewise lacking in a seta on its mid-ventral surface, while all the remaining segments are regularly supplied with setæ, which occur much oftener than in the other segments.

Reproductive Appendages.—Only the female appendages can be described, since males were lacking among all the specimens taken. Why such a condition exists in all the other species except K. wheeleri is a matter yet to be accounted for. While the males are lacking, the females must suffice to give specific character. In describing the appendages of the female almost the same description will hold good for K. florenciæ as was given for K. wheeleri. The anterior unpaired appendage of the second segment appears more pointed when viewed from below; while, when seen in profile, the sides of the appendage project backward and upward, forming a very deep trough with very thin sides. So thin are the lateral extensions of this appendage that they are easily overlooked in specimens thoroughly cleaned in KOH. The setæ of this appendage consist of ten pairs. The first row at the base, made up of three pairs, curve slightly downward. The second row of two pairs is situated further down on the appendage, and curves slightly in the opposite direction. The remaining hairs are arranged

in a somewhat irregular row on and near the edge of the appendage. The paired triangular appendages of the third segment, as usual, have three pairs of setæ—two long ones, arising on the posterior surface or from underneath, when viewed from the ventral surface, and a small one situated on the side of each appendage. The blades of these appendages are more pointed than the corresponding ones in K. wheeleri. Shining through the unpaired portion, and opening between the bases of the two paired ones of the reproductive appendages, is seen the large seminal vesicle, which is nearly oval in outline. This vesicle in K. wheeleri was flask-shaped, with the neck of the flask projecting downward. Figs. 6 and 7 of the plate show the true condition of these appendages better than any amount of description.

Flagellum.—When the material reached me through the mail the flagellum had been broken off in every case except one. This was an adult female, which had only twelve joints in the flagellum. However, I found floating around in the alcohol in which the specimens were sent, one flagellum of fifteen joints (counting the first small joint, which is never detached with the flagellum, but always remains with the body), another of fourteen joints, and another of twelve joints. In all these cases none of the proximal joints had been broken off except the small joint of which I have made mention. In these four flagella the second, third, fourth, sixth, eighth, and tenth joints had two whorls of setæ; a plumulose whorl of long setæ running around the middle of the joint, and a smooth terminal set which fitted closely over the subsequent joint. Always following the joint bearing the double whorl of setæ which precede the segment-bearing whorl of hairs are the very short, thick-walled sub-joints which may be looked upon as the anterior portion of the large joints, to which they are immovably attached. The terminal joint in two cases had two whorls of plumulose setæ; in the other two flagella it bore only one whorl. In every instance, except in the number of joints, the flagellum carries out all the observations made on the corresponding appendage in K. wheeleri.

Immature Stages.—These would be hardly worth mentioning, so fragmentary is the information obtained from two periods in the life-history, were it not that these two stages may give characters which phylogenetically are of the utmost importance. As is always expected in considering the young of any Arachnid, the hairs are few in number when compared with the adult, so these points can be passed over lightly except where hairs appear as specific characters of K. florenciæ. Of special importance, however, is the development of the reproductive appendages of the second and third abdominal segments. We saw that these appendages of K. wheeleri, in passing through their developmental stages, not only gave an inkling of the condition to be found in the male appendage of the adult, but also of the relative position of the species within the order. In K. florenciæ the older known stage presents characters in the reproductive appendage which become entirely lost in the adult female, but which resemble, in their possession of papillæ, the male appendages in K. wheeleri. The appendage of this stage in K. florenciæ, with greater elaboration brought about in its further development, probably becomes the male appendage of the adult; further collection, however, at different times of the year is needed to prove the truth of this conclusion.

Youngest known Stage.—The labrum presents the peaked condition found in the adult. One lateral sense-organ is present on each side. The number and arrangement of setæ on the carapace agree with the adult condition. Only one cephalothoracic sternal hair is present; this is situated on the mid-ventral line. No sensory hairs appear on the first metatarsus. The flat, hollow, and slightly curved seta situated on the outer side of the third metatarsus, one third of the distance from the proximal end, is present as in the adult. The characteristic setæ of the proximal joint of the cheliceræ occur as in the adult. The arrangement of setæ on the ventral surface of the abdomen is very regular. Beginning with the second segment and ending with the seventh segment

there are two longitudinal rows of hairs on either side of the mid-ventral line. In segment 3 these hairs are placed farther apart and farther from the mid-ventral line, thus making the longitudinal lines slightly curved. The seventh and eighth segments have one seta on each side of the mid-ventral line, while segments 9, 10, and 11 have one on each side and one on the mid-ventral line.

Second and Last known Stage.—The labrum is compressed laterally, and has four pairs of hairs. Usually two lateral sense-organs are present on a side, though in one case only one was observed on a side. There are three cephalothoracic hairs. The appendages have all the characteristics present in the adult. On the ventral surface of the abdomen the fourth, fifth, and sixth segments have each a group of three hairs, to the right and left respectively of the mid-ventral line, while the seventh segment has only one on a side; the eighth and eleventh segments have each three setæ, one on, and one on each side of the mid-ventral line; while the ninth and tenth segments have each four setæ arranged at equal distances apart across the ventral surfaces. It is the peculiar condition of segments 2 and 3 that makes this stage of the utmost importance. These segments are prolonged into appendages that give promise of becoming male appendages, inasmuch as they possess papillæ, a condition which has been found only in the male. The second segment is prolonged posteriorly and ventrally into a trowel-shaped appendage, slightly notched at the edge, giving it a paired appearance. There projects from its edge on either side of the mid-ventral line a papilla tipped with a plumulose spine. This appendage has four pairs of setæ, two pairs forming a downward curving row, while the two remaining pairs form an irregular row near the edge. The third segment gives rise to the usual pair of projections, which are supplied on the outer side with a small seta. Figs. 13 and 14 of the plate represent camera drawings of the front and side view of these simple appendages.

The Endosternite.—Characteristic of the Arachnida is

this endoskeleton, which lies in the cephalothoracic region between the nerve chain below and the stomach above. This organ, which is easily overlooked in K. wheeleri, has not been described for that species, but it has already been observed in K. mirabilis and represented in section by Mr. Börner. In K. florenciæ the endosternite comes out perfectly into view while a specimen is being treated with KOH. In K. wheeleri this is not the case, and unless one is on the sharp look-out it entirely escapes the notice, so readily does it dissolve away on the use of KOH, along with the surrounding muscle and nervous tissue. In K. florenciæ the endosternite is a **V**-shaped continuous plate, slightly swollen at the sides in the region between the fifth appendages. Posterior to these swellings, and more medianly situated, are two large triangular perforations, which may be said to divide the plate into two regions, an anterior **U**-shaped portion and a posterior **V**-shaped portion, which contains the above-mentioned perforations. Near the anterior limits of the arms of the **U** are two pairs of small oval apertures, while in the outermost edge of the base of the **U** are three oval apertures on either side. The attachment of the muscles of the endosternite I did not attempt to make out. Fig. 15 of the plate will make much clearer than descriptions can the structure of the endosternite.

Systematic.—Following the discoveries made by Dr. Silvestri of two species of Koenenia in South America, and by Dr. Mortensen on the island of Koh Chang, in the Bay of Siam, of two other species, comes the new North American and North Texan Koenenia, which makes it seem all the more probable that the hitherto rare order is well represented over the globe. That one of the South American species—K. chilensis, Hansen—possesses lung-sacs, while the other—K. grassi, Silvestri—does not, and that the same condition occurs in the case of the two North American species—K. wheeleri possessing lung-sacs, while K. florenciæ does not,—is a point of great interest which invites further

consideration. From an analytical standpoint, the presence of these lung-sacs in some species only, seems sufficient ground for a definite and well-marked division of the genus Koenenia into two sub-genera. Mr. Börner[1] was the first to make the suggestion, basing the distinction on the condition of the reproductive appendages. Unfortunately he was misled, by Dr. Wheeler's mistaken description of the male for the female, into believing that the appendage of the second abdominal segment in K. wheeleri was paired, and represented a more primitive condition; hence he placed K. wheeleri under the sub-genus Prokoenenia, while the then only other known species, K. mirabilis, he placed under the sub-genus Eukoenenia. However, inasmuch as K. mirabilis presents a slightly paired or notched condition of the reproductive appendage, and inasmuch as K. wheeleri passes through a stage in its development[2] which is more nearly comparable to K. mirabilis, their position in the sub-genera would have to be reversed if we attempt to carry out Mr. Börner's suggestion. With his permission, then, I adopt his sub-genera Prokoenenia to include all species possessing lung-sacs, and Eukoenenia to include those species not possessing lung-sacs.

In regard to exact characters indicative of the species, further observations will have to be made before anything like a definite and concise analytical table can be arranged. Of the three species which I have been able to examine and compare—K. wheeleri, K. mirabilis, and K. florenciæ —the relative size of the three more distal setæ of the proximal joint of the chelicerae was a prominent and characteristic feature of the species. In descriptions[3] of the other four species no stress is laid on the distinction; and the setæ are figured in only one of the species, K. angusta. For the

[1] "Zur äuf seren Morphologie von Koenenia mirabilis, Grassi," aus dem 'Zoologischen Anzeiger,' Bd. xxiv, No. 652, p. 551.

[2] 'Zoologische Jahrbücher,' 1903.

[3] "On Six Species of Koenenia, with Remarks on the Order Palpigradi," H. J. Hansen, 'Entomologisk Tidskrift,' 1901.

three species which I examined, the ventral view showing the relative size of these setæ, the arrangement of the hairs of the fourth, fifth, and sixth segments of the abdomen, and the number and arrangement of the cephalothoracic sternal hairs, give an immediate clue to the species. In arranging any analytical table these specific points should come first in consideration. The females, which probably differ from the males only in their reproductive appendages, must be used entirely in furnishing the description for the species.

A. Lung-sacs present on the ventral side of the fourth, fifth, and sixth segments of the abdomen.

Prokoenenia.

1. Between the lung-sacs on segments 4 and 5 are three pairs of long backward turning hairs. These hairs are absent on segment 6. A group of four shorter hairs is present for protection over the aperture on each lung-sac. Usually fifteen cephalothoracic sternal hairs are present, eight of which are arranged in a transverse row, and seven form a V anterior to this row. The three setæ of the proximal joint of the chelicerae of equal size. Labrum rounded anteriorly, and possessing along its lip six pairs of delicate hairs. A group of four lateral sense-organs present on a side. The stiff, hollow seta is situated on the distal limit of the third metatarsus of the first leg.

Koenenia (Prokoenenia) wheeleri. Rucker.

2. No long hairs are present between the lung-sacs. Ventral surfaces of the fourth, fifth, and sixth segments are alike. A group of three hairs is present over the orifice of each lung-sac. Eight cephalothoracic sternal hairs are present, arranged at the corners of two concentric rectangles. Two lateral sense-organs are present on a side. The flat, hollow seta is situated at the middle of the third metatarsus of the first leg.

Koenenia (Prokoenenia) chilensis. Hansen.

B. Lung-sacs absent from the ventral surface of the fourth, fifth, and sixth segments of the abdomen.

Eukoenenia.

3. "On the ventral surface, a group of five or six spine-like setæ on the fourth segment, and a protruding wart with six procurved setæ on the sixth segment." Two slightly curved, transverse rows of five and six setæ respectively are present on the sternum of the cephalothorax. The three setæ of the proximal joint of the cheliceræ are all of different lengths, the most distal one being decidedly the longest. Labrum more rounded, with five pairs of lip hairs. One lateral sense-organ present on a side. The hollow seta of the third metatarsus of the last leg is inserted at the middle of the joint.

Koenenia (Eukoenenia) mirabilis. Grassi.

4. Fourth segment of the abdomen has on its ventral side one seta on each side of the mid-ventral line, while the fifth and sixth segments have two setæ on a side. Three cephalothoracic sternal hairs are present arranged in a transverse row. A group of three lateral sense-organs are present on a side. The stiff hollow seta is inserted near the base of the third metatarsus of the first leg.

Koenenia (Eukoenenia) angusta. Hansen.

5. Ventral surfaces of the fourth, fifth, and sixth segments of the abdomen have, on each side of the mid-ventral line, two setæ. Seven cephalothoracic sternal hairs are present, arranged in two intersecting diagonal rows. A group of three lateral sense-organs is present on a side. The stiff, hollow seta is inserted at the middle on the third metatarsus of the first leg.

Koenenia (Eukoenenia) siamensis. Hansen.

6. Ventral surfaces of the fourth, fifth, and sixth segments have on each side of the mid-ventral line a group of four hairs. The cephalothoracic sternal hairs consist of five,

arranged in a transverse row. The anterior seta of the proximal joint of the cheliceræ four times longer than either of the other two. Labrum compressed laterally to a point, and possessing on its lip five pairs of hairs. A group of three lateral sense-organs is present on a side. The flat, hollow seta situated one third of the distance from the proximal limit of the third metatarsus of the first leg.

Koenenia (Eukoenenia) florenciæ.

7. Ventral surfaces of the fourth and fifth segments of the abdomen with a group of four hairs on each side of the mid-ventral line, while only three pairs of hairs are present on the sixth segment. Eight cephalothoracic hairs are present, irregularly arranged. A group of three lateral sense-organs is present on a side. The stiff, hollow seta is inserted near the base of the third metatarsus of the first leg.

Koenenia (Eukoenenia) grassii. Silvestri.

In conclusion I have arranged in a convenient form the table given below, which records the places from which the species were taken, together with the more prominent characters of each species.

	K. mirabilis.	K. wheeleri.	K. chilensis.	K. angusta.	K. siamensis.	K. grassi.	K. florenciæ.
Lung-sacs	0	3 pairs	3 pairs	0	0	0	0
Hairs of cheliceræ	1 large, 1 medium, 1 small	3 of equal size.	Undetermined	1 large, 2 small	Undetermined	Undetermined	1 very large, 2 small
Number of cephalothoracic sternal hairs	10 to 11	15	6	3	7	8	5
Hairs between lung-sac area	Segment 4, 5 or 6; segment 6, 6	Segment 4, 3 pairs; segment 5, 3 pairs; segment 6, none	0	0	0	0	0
Number of hairs in group over lung-sac area of fourth segment	—	4 pairs	3	1	2	4	4
Number of hairs in group over lung-sac area of fifth segment	—	4	3	2	2	4	4
Number of hairs in group over lung-sac area of sixth segment	—	4	3	2	2	3	4
Number of lateral sense-organs in a group	1	4	2	3	3	3	3
Type locality	Italy and Sicily	Austin, Texas	Chile	Koh Chang, Bay of Siam	Koh Chang, Bay of Siam	Paraguay	Bonham, Texas.

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EXPLANATION OF PLATE 18.

Fig. 1.—Dorsal view of K. florenciæ (8 oc. × 3 obj.). The setæ of head, thorax, and abdomen are shown in their natural position. The abdomen is slightly rolled to the left, so that the broad strip along the mid-dorsal line which is devoid of setæ is not so striking.

Fig. 2.—Ventral view of the head and thorax of K. florenciæ (1 oc. × 7 obj.). The arrangement and position of setæ of the proximal joint of the cheliceræ are shown. The distal joints of the cheliceræ which often obscure the setæ are not drawn. The characteristic peaked condition of the labrum with its curved row of five pairs of hairs is shown. The five cephalothoracic sternal hairs are shown in their natural position. The peculiar thimble-shaped thickening of the sternum between the fifth pair of appendages appears in all the stages as is figured here in the adult.

FIG. 3.—*a*. Lateral sense-organs in natural position when viewed from above. *b*. The same seen from the side and slightly displaced through pressure (8 oc. × 7 obj.).

FIG. 4.—Frontal sense-organ (8 oc. × 7 obj.).

FIG. 5.—The first leg of the left side beginning with the patella. The relative lengths of the sensory hairs are correctly drawn (1 oc. × 7 obj.).

FIG. 6.—Female reproductive appendages (1 oc. × 7 obj.).

FIG. 7.—Ventral surface of abdomen of adult female showing position of setæ (8 oc. × 3 obj.).

FIG. 8.—*a*. Large seta from proximal joint of chelicera of K. florenciæ. *b*. The corresponding seta of K. wheeleri (8 oc. × 7 obj.).

FIG. 9.—Chelicera of K. florenciæ when seen from the under side (1 oc. × 7 obj.).

FIG. 10.—Chelicera of K. mirabilis when viewed from the inner side (1 oc. × 7 obj.).

FIG. 11.—Chelicera of K. wheeleri. Same view and same magnification.

FIG. 12.—Tip of fixed joint of chelicera of K. florenciæ showing the peculiar chitinous arrangement in its cavity (8 oc. × 7 obj.).

FIG. 13.—Side view of the reproductive appendages in the oldest ontogenetic stage found (8 oc. × 7 obj.).

FIG. 14.—Front view of the same region which has been flattened out through pressure.

FIG. 15.—Endosternite as seen from above (8 oc. × 7 obj.). The broad transverse piece with its lateral enlargements containing three oval apertures lies in the region between the fifth appendages.